

IN THE CLAIMS

1. (currently amended) An osteosynthetic aid for tubular bones, comprising a locking nail which has a longitudinally extending shank with first and second ends and, ~~at the two ends of said shank,~~ has at least one cross-bore extending along an axis transverse to a longitudinal axis of the shank and a-headed locking screw having a head for extending through said cross-bore and a biasing sleeve which extends adjacent the locking screw along the transverse axis and resiliently deforms in an axial direction, for fixing disposed between the head of the locking screw and an outer shank surface surrounding the cross-bore in the locking nail shank.

2. (original) The osteosynthetic aid as set forth in claim 1 wherein the sleeve has a radial flange at one end against which the head of the locking screw comes to bear.

3. (original) The osteosynthetic aid as set forth in claim 2 wherein the locking screw has a threaded portion which interengages with a thread of a cross-bore.

4. (original) The osteosynthetic aid as set forth in claim 1 wherein the locking screw is a tibial bolt which has a first head at one end and a second head at an opposite end onto which the tibial nut is adapted to be screwed and a first biasing sleeve is disposed between the head of the tibial bolt and the nail shank and a second biasing sleeve is disposed between the nail shank and the tibial nut.

5. (canceled)

6. (canceled)

7. (canceled)

8. (canceled)

9. (canceled)

10. (canceled)

11. (currently amended) An apparatus for fixing a shank of an implant for a long bone in a direction transverse to an axis of the long bone, comprising:

a bone screw having a first portion including an end with a head and a leading second portion for insertion through a bore in an implant said shank the bore extending along an axis transverse to a longitudinal axis of the implant shank;

a first biasing element having a deformable wall surrounding a central opening for receiving the screw second portion, said first screw head portion engaging a first end of said biasing element, an outer surface of the shank surrounding the bore in said nail-implant shank engaging a second end of said biasing element, the biasing element resiliently deformable along the transverse axis.

12. (original) The apparatus as set forth in claim 11 wherein the biasing element is a sleeve having a series of axially spaced circumferentially extending slots which are circumferentially offset from one another.

13. (original) The apparatus as set forth in claim 12 wherein end portions of the circumferential slots overlap one another.

14. (original) The apparatus as set forth in claim 13 wherein the circumferential slots extend through an angle of more than 180°.

15. (original) The apparatus as set forth in claim 14 wherein adjacent slots are offset by about 90° from one another.

16. (original) The apparatus as set forth in claim 11 wherein said screw second portion is releasably coupled to said first portion, said second portion having an end opposite said end of said first portion having a head, said end including a head.

17. (original) The apparatus as set forth in claim 16 further including a second biasing element having a first end for engaging the head of the second screw portion and an end engaging said nail shank.

18. (original) The apparatus as set forth in claim 17 wherein the biasing element is a sleeve having a series of axially spaced circumferentially extending slots which are circumferentially offset from one another.

19. (original) The apparatus as set forth in claim 18 wherein end portions of the circumferential slots overlap one another.

20. (original) The apparatus as set forth in claim 19 wherein the circumferential slots extend through an angle of more than 180°.

21. (original) The apparatus as set forth in claim 20 wherein adjacent slots are offset by about 90° from one another.

22. (currently amended) A method for fixing an implant shank in a long bone, ~~the shank having an opening therein extending along an axis transverse to an axis of a long bone,~~ comprising:

inserting said shank into the long bone, the shank having an opening therein extending along an axis transverse to an axis of a long bone;

aligning a biasing sleeve having a deformable walls extending between first and second ends thereof, the walls surrounding a central bore therein, with the transverse opening in the shank the biasing sleeve second end engaging an outer surface of the shank surrounding the transverse opening;

inserting a bone screw having a first portion including an end with a head and a threaded second portion through said biasing sleeve and into said transverse opening in said shank;

compressing said biasing sleeve by deforming the walls thereof in the direction of the transverse axis by tightening said bone screw so that the head thereof engages the first end of the biasing sleeve and the second end of said sleeve engages a first side surface of said shank.

23. (original) The method as set forth in claim 22 wherein said compressing includes inserting said threaded screw second portion into a threaded nut aligned with said transverse shank opening on a second side of said shank opposite said first side.

24. (currently amended) The method as set forth in claim 23 further comprising inserting a second biasing sleeve between said nut and said second side of said shank and comprising compressing said second biasing sleeve by tightening said bone screw.

25. (new) A method for fixing an implant shank in a long bone, the shank having an opening therein extending along an axis transverse to an axis of a long bone, comprising:

inserting said shank into the long bone;

aligning a biasing sleeve having deformable walls extending between first and second ends thereof surrounding a central bore therein with the transverse opening in the shank;

inserting a bone screw having a first portion including an end with a head and a threaded second portion through said biasing sleeve and into said transverse opening in the shank;

compressing the biasing sleeve by deforming the walls thereof by tightening said bone screw so that the head thereof engages the first end of the biasing sleeve and the second end of said sleeve engages a first side of said shank, wherein said compressing includes inserting said threaded screw second portion into a threaded nut aligned with said transverse shank opening on a second side of said shank opposite said first side, further comprising inserting a second biasing sleeve between said nut and said second side of said shank and compressing said second biasing sleeve by tightening said bone screw.

26. (new) An apparatus for fixing a shank of an implant for a long bone in a direction transverse to an axis of the long bone, comprising:

a bone screw having a first portion including an end with a head and a second portion for insertion through a bore in said shank;

a first biasing element having a deformable wall surrounding a central opening for receiving the screw portion, said first screw head portion engaging a first end of said biasing element, wherein said nail shank engaging a second end

of said biasing element said screw second portion is releasably coupled to said first portion, said second portion having an end opposite said end of said first portion having a head, said end including a head, further including a second biasing element having a first end for engaging the head of the second screw portion and an end engaging said nail shank.

27. (new) An apparatus for fixing a shank of an implant for a long bone in a direction transverse to an axis of the long bone, comprising:

a bone screw having a first portion including an end with a head and a second portion for insertion through a bore in said shank;

a first biasing element having a deformable wall surrounding a central opening for receiving the screw portion, said first screw head portion engaging a first end of said biasing element, said nail shank engaging a second end of said biasing element, wherein the biasing element is a sleeve having a series of axially spaced circumferentially extending slots which are circumferentially offset from one another.

28. (new) An osteosynthetic aid for tubular bones, comprising a locking nail which has a shank with first and second ends and, at the two ends of said shank, has at least one cross-bore extending along a transverse axis and a headed locking screw for extending through said cross-bore and a biasing sleeve which resiliently deforms in an axial direction of the biasing sleeve, for fixing a bone portion disposed between a head of the locking screw and the shank.

29. (new) An apparatus for fixing a shank of an implant for a long bone in a direction transverse to an axis of the long bone, comprising:

a bone screw having a first portion including an end with a head and a second portion for insertion through a bore in said shank;

a first biasing element having a deformable wall surrounding a central opening for receiving the screw portion, whereby the deformable wall is adapted to allow for a resilient deformation of the first biasing element in an axial direction, said first screw head portion engaging a first end of said biasing element, an implant shank engaging a second end of said biasing element.

30. (new) A method for fixing an implant shank in a long bone, the shank having an opening therein extending along an axis transverse to an axis of a long bone, comprising:

inserting said shank into the long bone;

aligning a biasing sleeve having deformable walls extending between first and second ends thereof surrounding a central bore therein with the transverse opening in the shank;

inserting a bone screw having a first portion including an end with a head and a threaded second portion through said biasing sleeve and into said transverse opening in said shank;

compressing said biasing sleeve in an axial direction by deforming the walls thereof by tightening said bone screw so that the head thereof engages the first end of the biasing sleeve and the second end of said sleeve engages a first side of said shank.